

PLACES*: A Tool for Sustainable Land Use

Verle Hansen, PhD
USEPA/ORD/NRMRL/LRPCD
26 West Martin Luther King Drive
Cincinnati, Ohio 45202

hansen.verle@epa.gov

* Planning Land And Communities to be Environmentally Sustainable

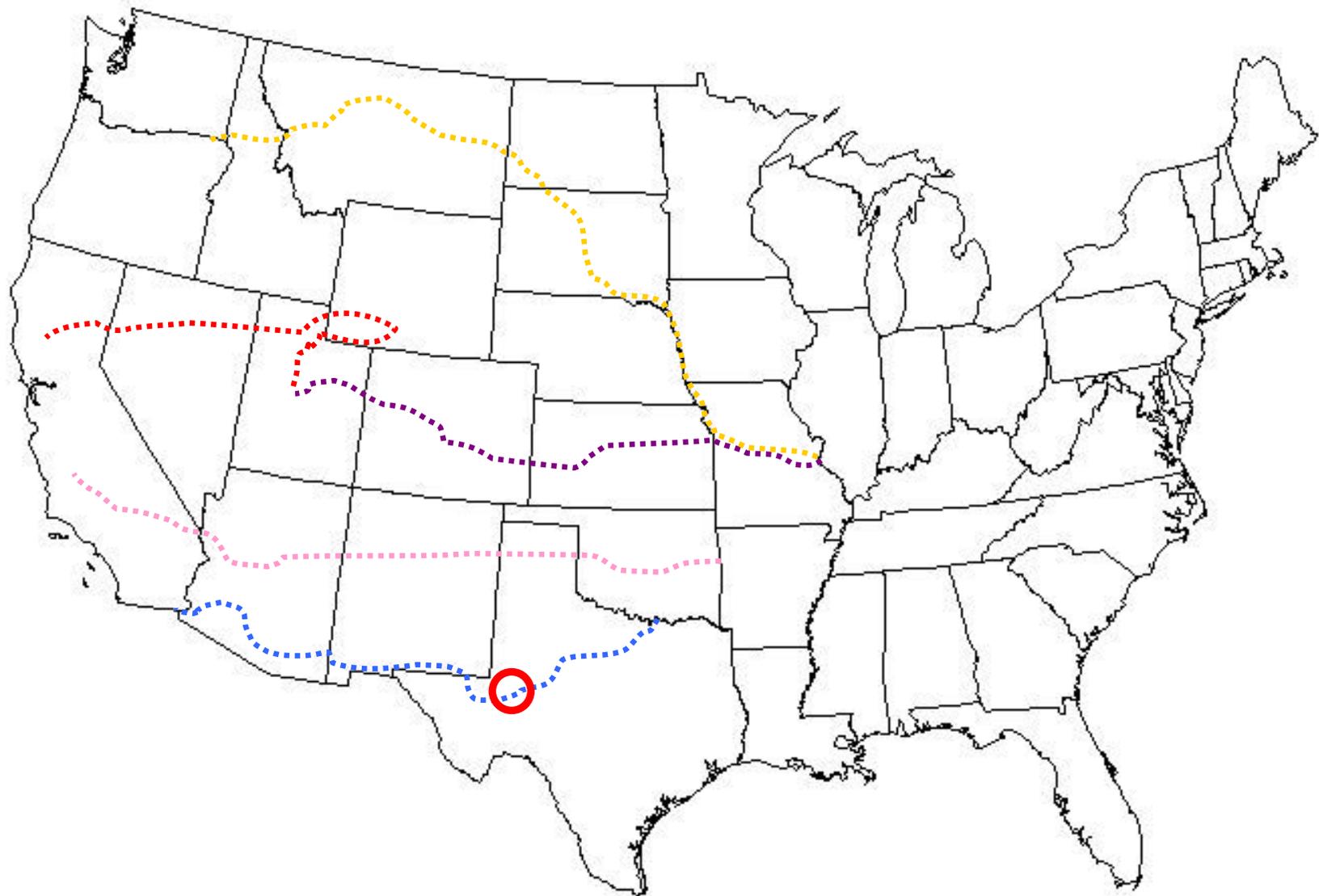




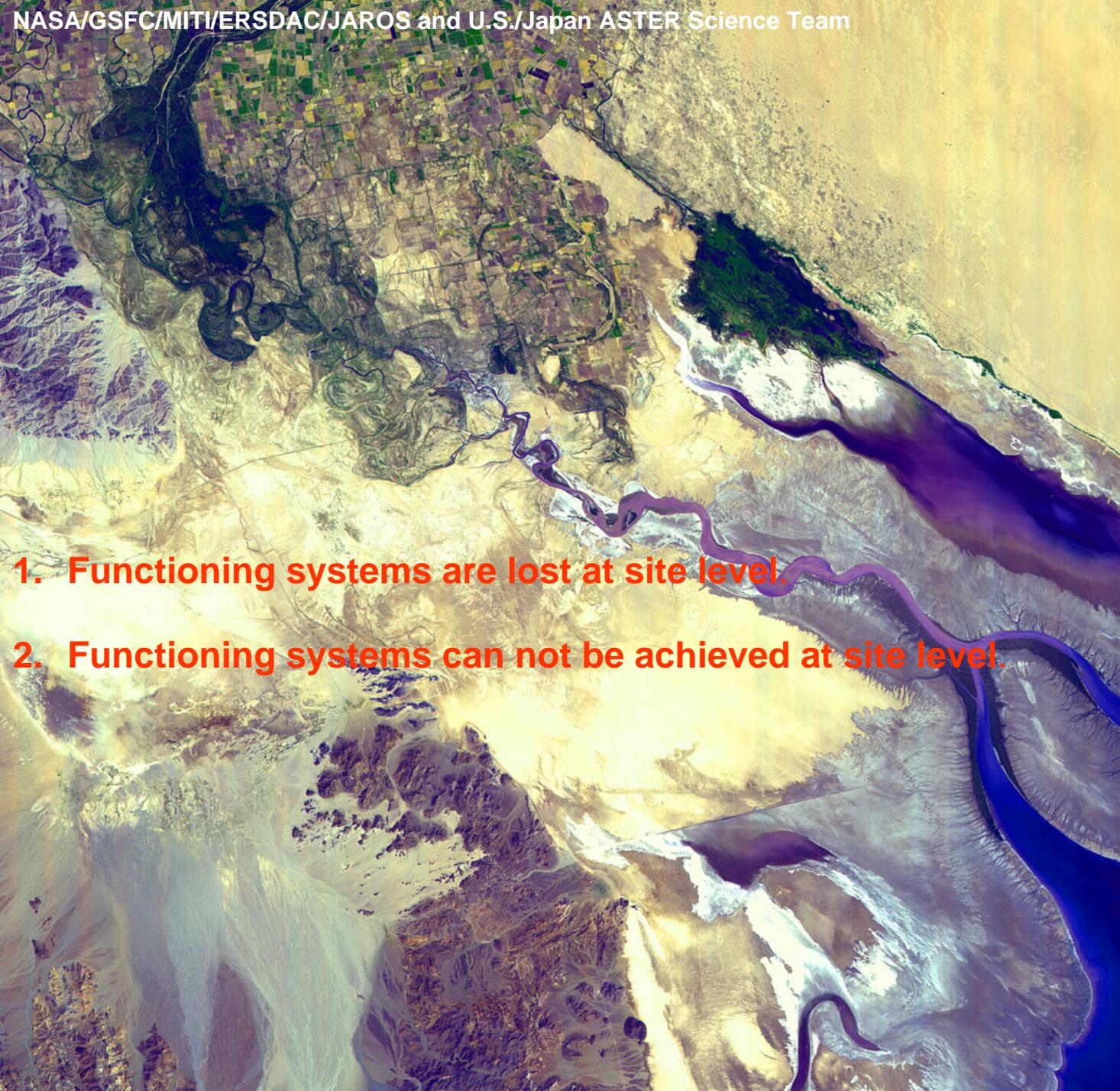
Image NMRGIS
© 2009 Europa Technologies
Image USDA Farm Service Agency
© 2009 Google

© 2009 Google

Imagery Dates: Jun 28, 2005 - Jul 2005

31°59'52.81" N 103°59'08.52" W elev 2864 ft

Eye alt 8540 ft

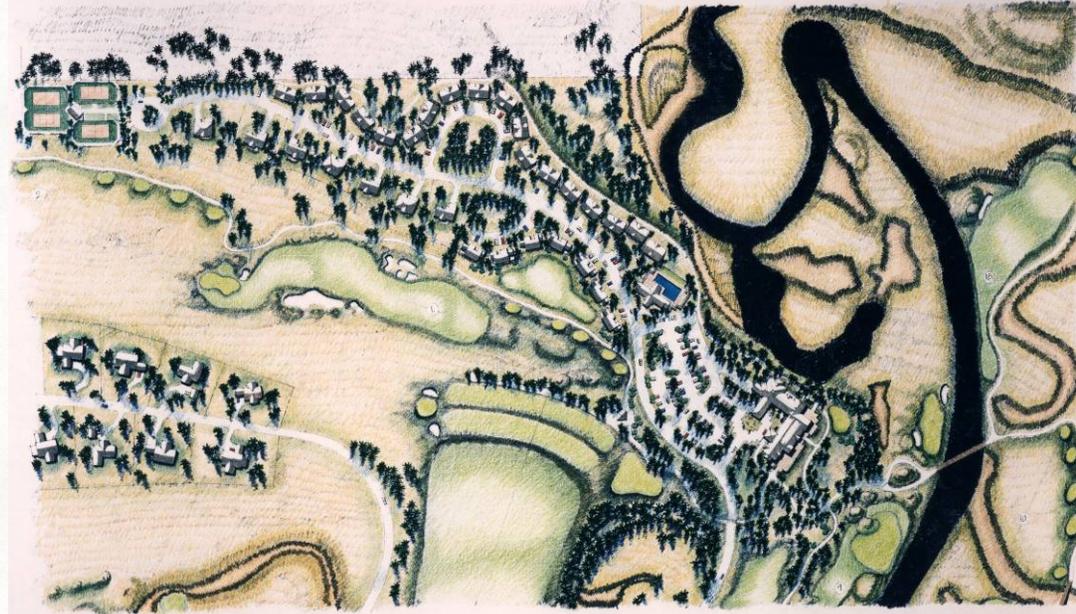
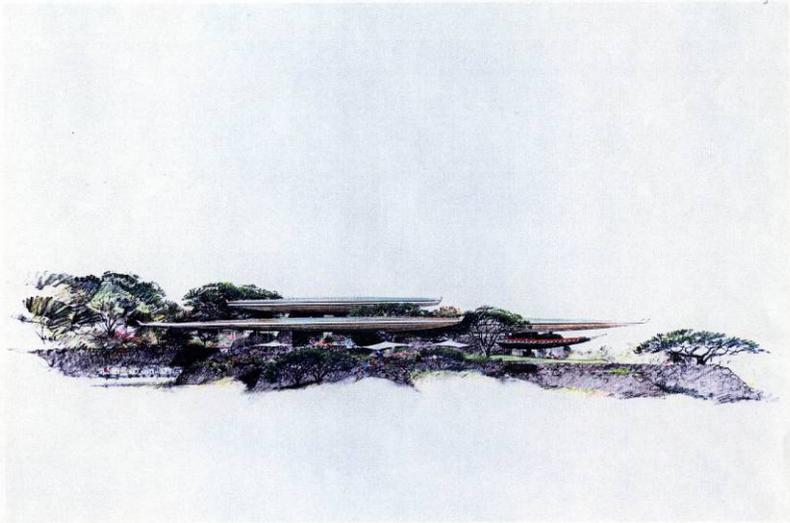


1. **Functioning systems are lost at site level.**
2. **Functioning systems can not be achieved at site level.**

Sustainability applies to Systems

“Many of the world's biggest rivers, including the Nile, Ganges, Yangtze and Danube, are facing catastrophic collapse due to man-made problems, A wasteful attitude to water use and inadequate protection of rivers has destroyed ecosystems while threatening the livelihoods of people living in river basins.”

“We're talking about a complete collapse of the system -- they're so polluted, so over-extracted or so cut up by dams that it's really not functioning as a river any more.” Tom le Quesne, freshwater policy officer, WWF-UK



Planner has 3 options:

1. Ignore the environment.
2. Minimize environmental impacts
3. Use Sustainability Criteria

Can not address systems

Addresses systems attributes

Need a 4th option

4. Plan w/i systems contexts

PLACES

Protection AND Sustainable
REQUIRE:

1. Actions w/i Systems context
2. Systems strategy to counteract losses



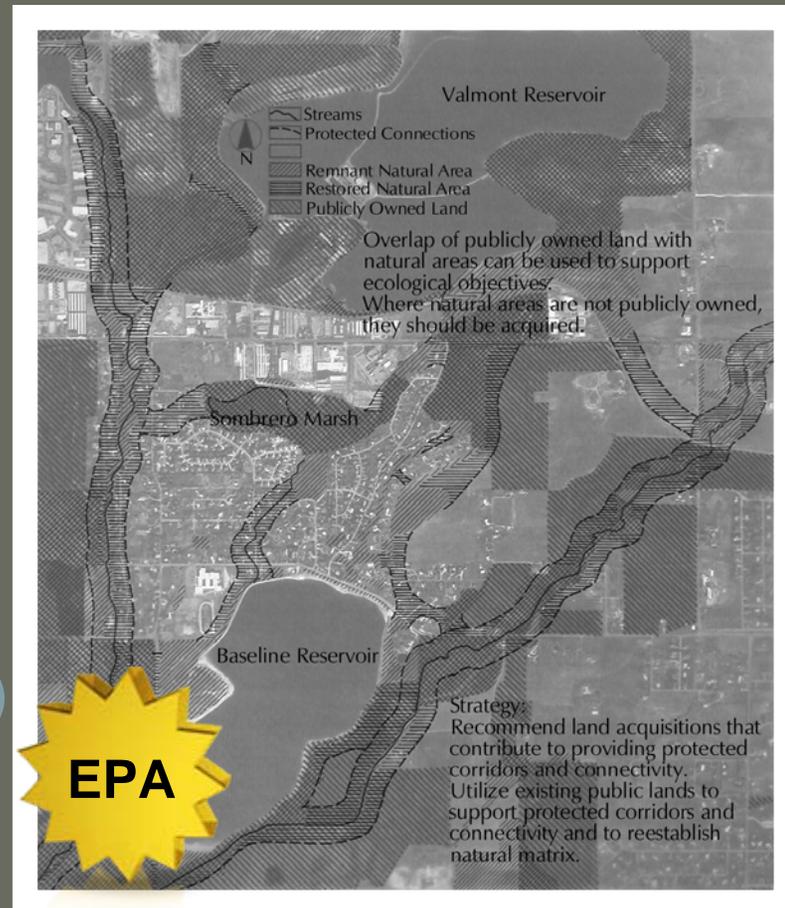
Response: **P.L.A.C.E.S.** (the tool)

1. Systems context

1. Functioning Ecosystems
2. Functioning Social Systems
3. Functioning Economic Systems

2. Systems strategy

1. Public program to renew/protect systems
2. Enables developer participation beyond site



P.L.A.C.E.S. – credits communities (the audience) that minimize and counteract environmental, social, economic externalities.
“US EPA Certificate of Sustainable Community”

by...(a) integrating natural systems into land-use decisions (level of application)

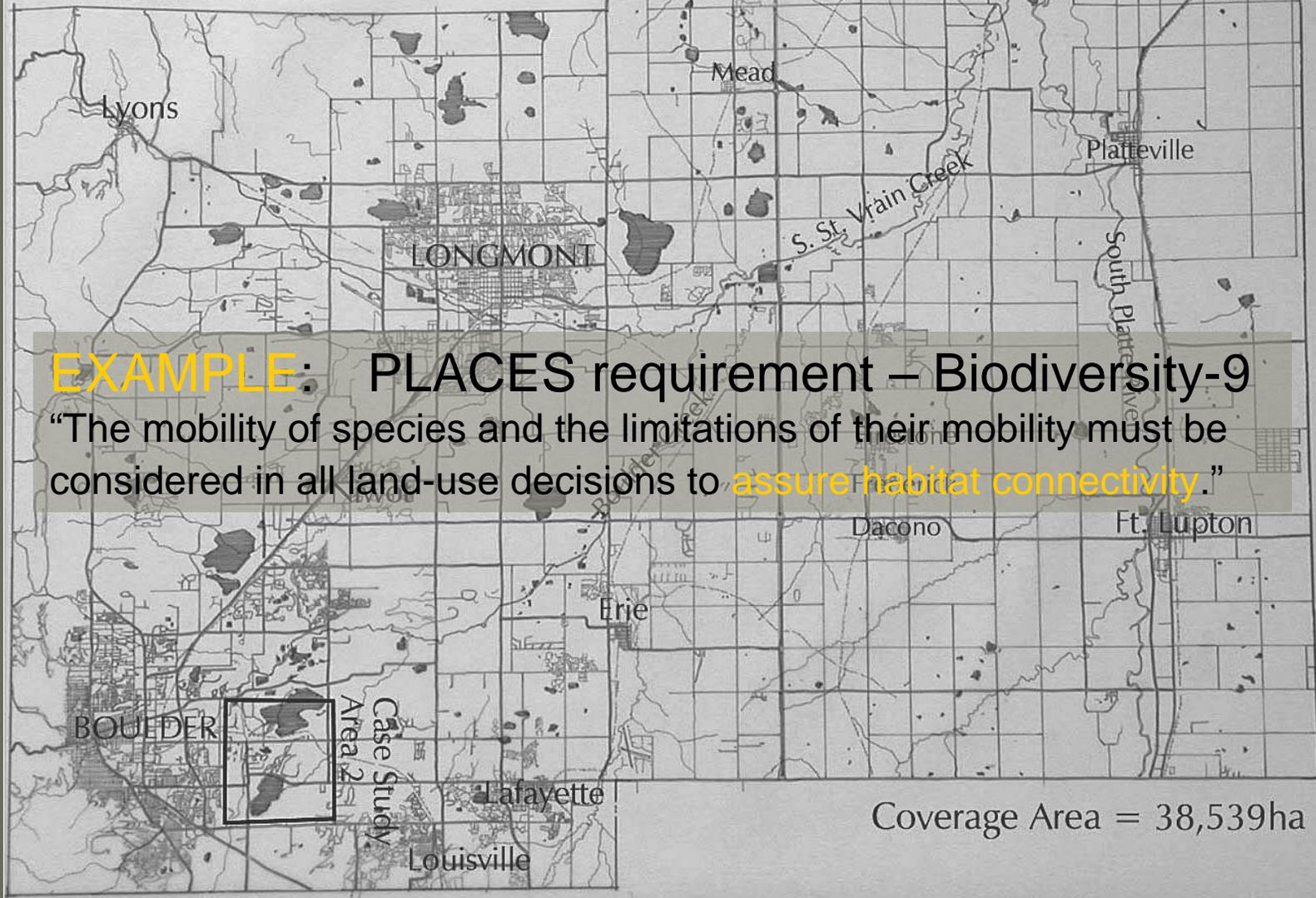
(b) enabling site users to participate in renewing natural systems (level of application)

No.	Pnts	System Component	Condition of Intact Systems	Intent	Requirement	Standard
		Natural Systems	The condition of the environment within which human life has evolved remains within human tolerances.	<p>A. The environment is clean and non-toxic to human life.</p> <p>B. Natural systems are not compromised by human activities.</p> <p>C. The complex webs of natural resources are maintained.</p>	<p>Document existing condition of the following relative to current human health standards.</p> <p>Natural productivity, Native biodiversity, Soils, Water, Air, and Atmosphere</p> <p>Present condition of and threats to regional natural productivity, native biodiversity, soils, water, air, and atmosphere are to be evaluated relative to human health standards; and a plan of action to restore/maintain these to EPA standards is created and integrated into land-use regulations and policies.</p>	
			Understanding of the human-environment relationship is enhanced.	Each of our interventions into the natural environment should become a living laboratory that furthers the science of human-environment relationships.	Land-use decisions are to be made that meet human objectives within conditions that keep natural systems intact.	
		Productivity	Maintain near-natural Nitrogen levels in soil and water	Reestablish and/or maintain near-natural biomass and productivity to the environment.	Calculate impact of proposed agriculture, land-use change, and development on soils, water, and natural productivity using 'SubLoad Model' and 'MANAGE Method'.	SubLoadmodel (xls)
		Productivity	Productive biomass of an land area is at near-natural levels.	The amount of biomass that is supported by the native landscape should remain relatively constant from year to year except as influenced by and recoverable from natural variations in climate and natural disturbance regimes.	<p>Determine the amount of natural productivity that would exist in an area without human interventions.</p> <p>Develop a regional plan that would keep natural productivity intact, utilize and manage all remnant land-uses to restore natural productivity.</p>	<ol style="list-style-type: none"> 1997 UN Watercourses Conv. Art 20 1992 Convention on Biodiversity
		Biodiversity, Soils Water, Air Atmosphere	see table	see table	see table	
		Social Systems	Social Systems remain intact and able to sustain and expand quality of life.	Quality of life is possible for this and all future generations.	see table	
		Economic Systems	Qualitative community resources are improved.	<p>Resources use improves the quality of life for local people beyond providing immediate and temporary income.</p> <p>When a natural resources is consumed, society should see some benefit that is worthy of the loss of any resource.</p>	<p>All resources that provide services to local citizens are documented and evaluated to determine the 7 most essential to sustain the local human population.</p> <p>A strategy is developed to result in annual increases in the quality, value, and longevity of these resources; and to develop substitutes when these resources are exhausted.</p>	



NORTH

-  Rivers, Streams
-  Reservoirs
-  Roads, Paved Areas
-  Railroad Tracks



EXAMPLE: PLACES requirement – Biodiversity-9

“The mobility of species and the limitations of their mobility must be considered in all land-use decisions to assure habitat connectivity.”

Coverage Area = 38,539ha



NORTH

- Rivers/Tributaries
- Reservoirs
- Streets/Paved Areas
- Railroad Tracks

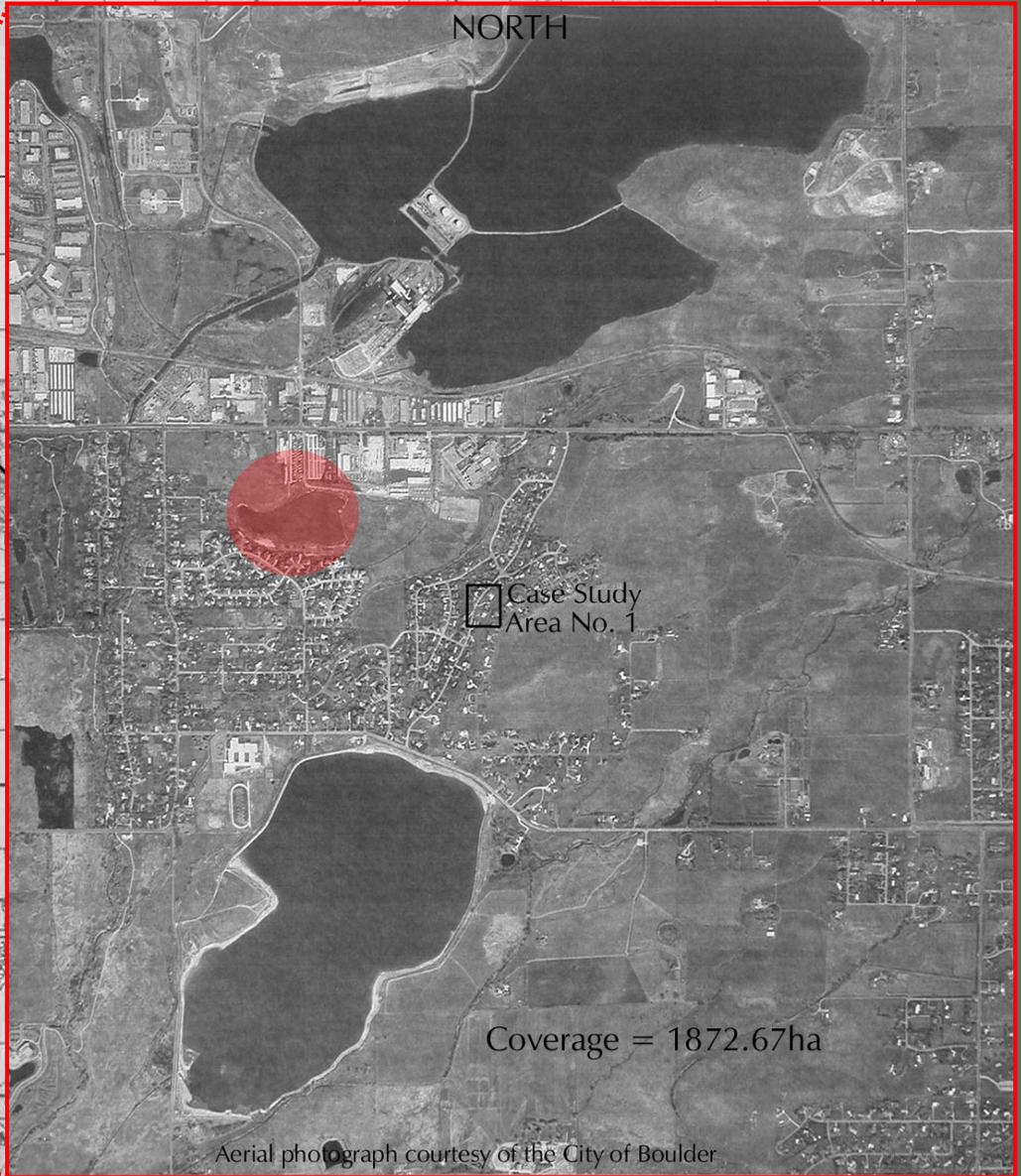
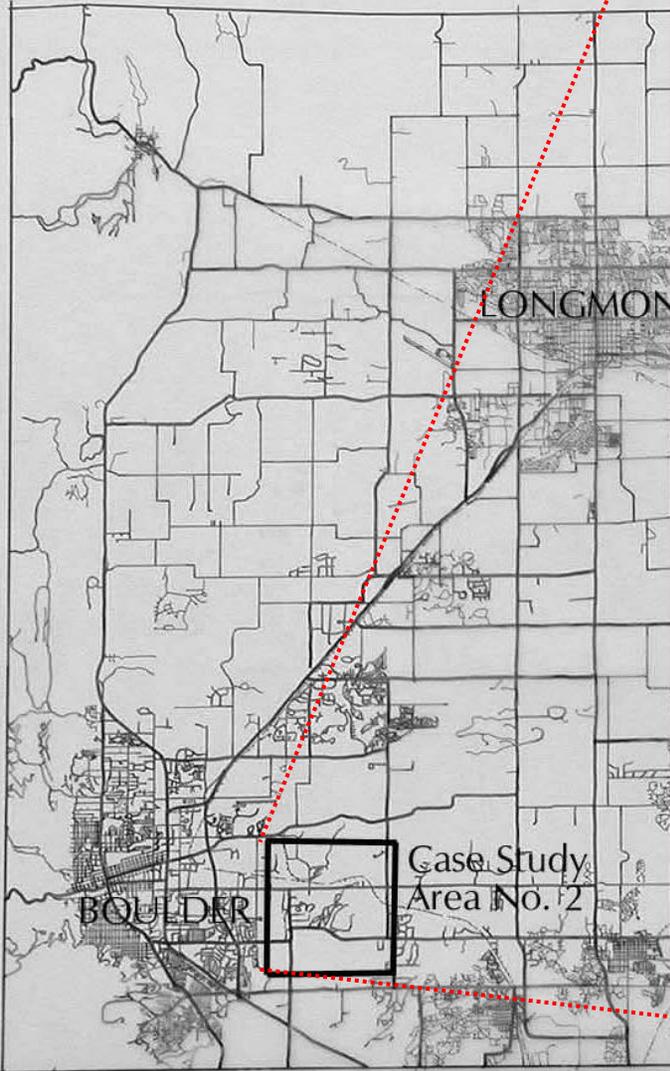
- Riparian Corridors
- Upland Connectors
- Wetlands

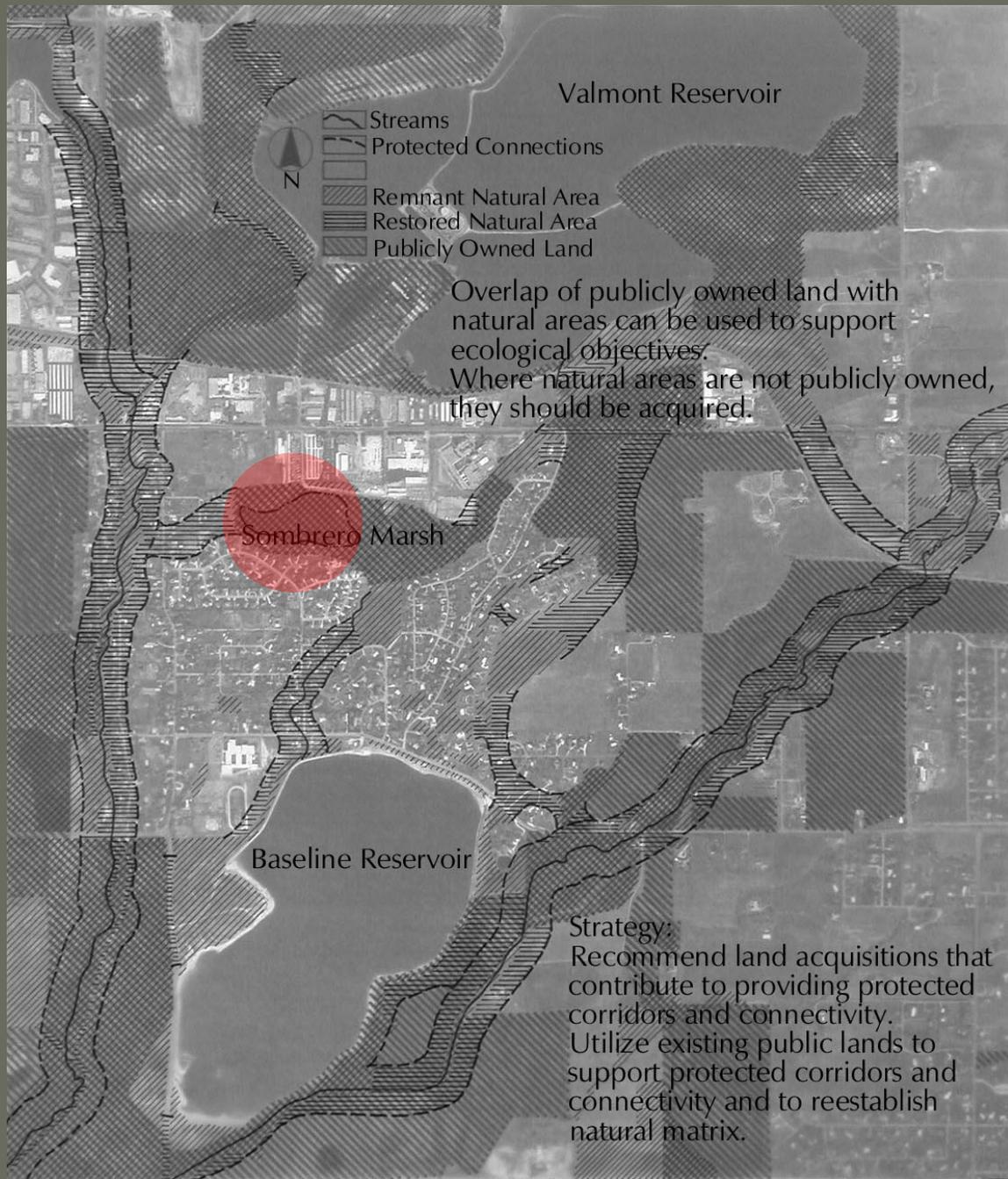
- Unique Ntrl. Areas





-  Paved Roads etc.
-  Railroad





NORTH



Case Study Area No. 1

Coverage =

Chart Area = 26,550 sq. m. = 2.655ha

Site Area = 26,335 sq.ft. = 0.6188 acres
= 2446.6 sq.m. = 0.02446 ha



Aerial photograph courtesy of the City of Boulder

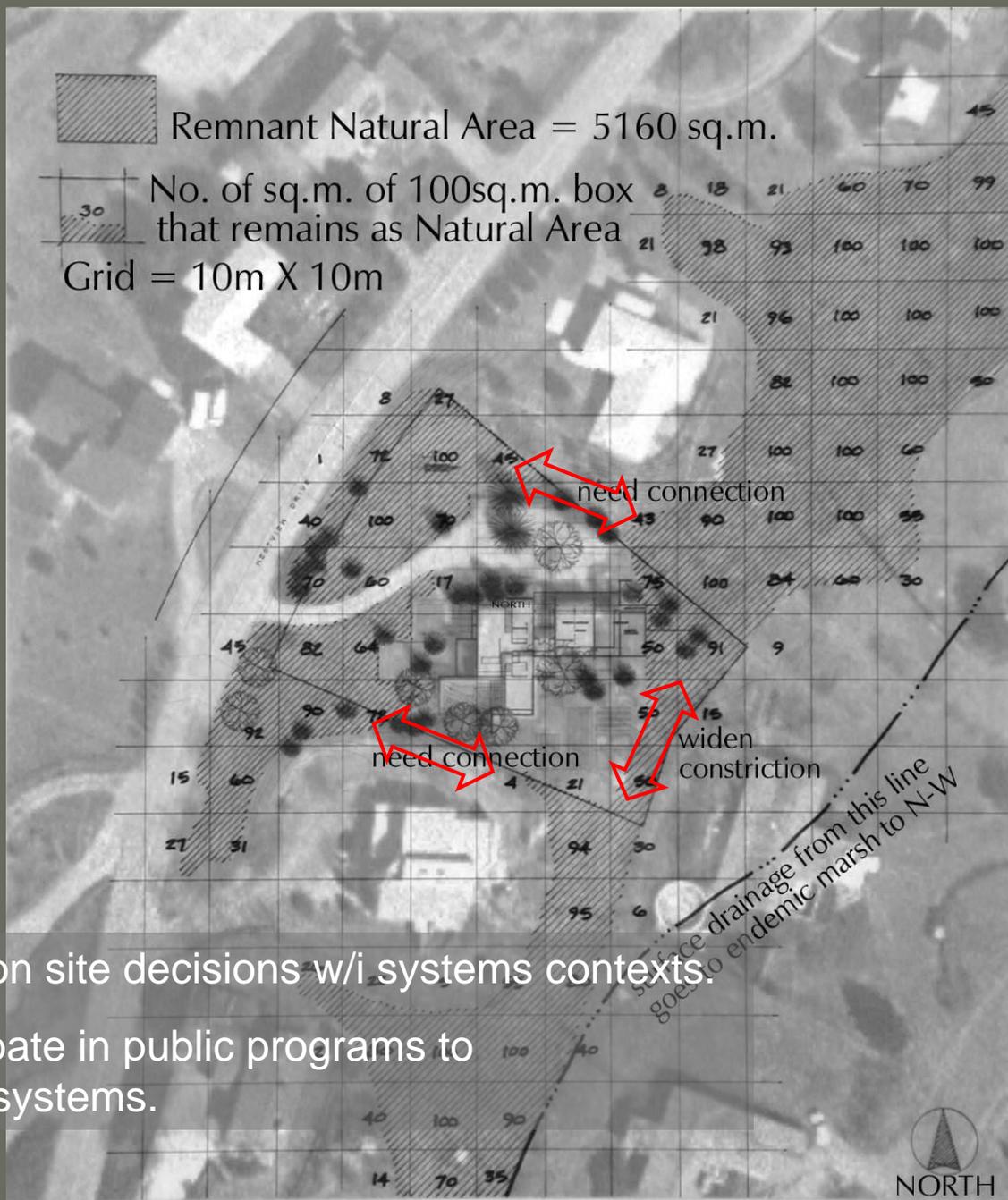


Remnant Natural Area = 5160 sq.m.



No. of sq.m. of 100sq.m. box
that remains as Natural Area

Grid = 10m X 10m



(a). Can make on site decisions w/i systems contexts.

(b). Can participate in public programs to restore/protect systems.

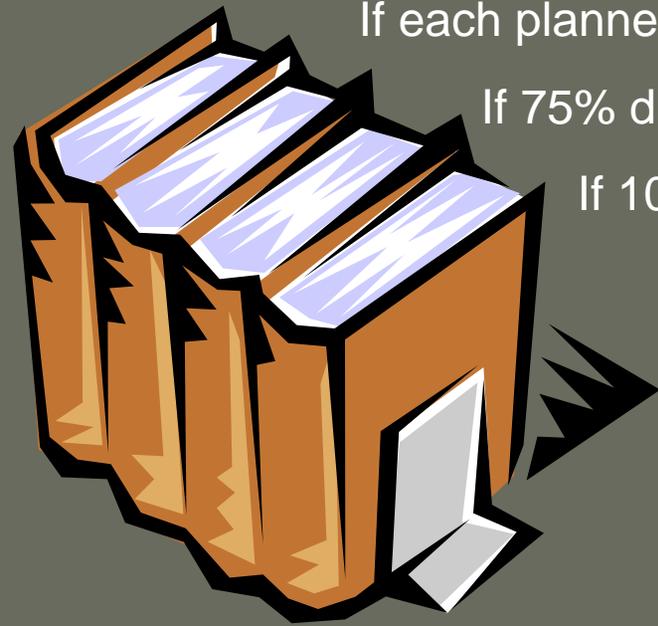
The Power of PLACES

34,000 planners in U.S. (2006)

If each planner finds 10 responses to 50 reqs = 340,000 responses

If 75% duplicates = 85,000 unique responses (a catalogue)

If 10% apply to any site = 8500 responses/site
(problem solved in planning – a 1x fix)



The Power of PLACES
If PLACES had existed before development

EPA estimates 500,000 – 1 million **brownfields** in US

Assessment costs @ \$100,000/site = \$50 – \$100 billion saved

Cleanup costs (Allbusiness est. ave.) \$600,000 – \$1 million

for 500,000 sites = \$300 – \$600 billion saved

for 1 million sites = \$600 – \$1000 billion saved

(€700,000 million)

The Power of PLACES
Residential land uses only



Building permits 2008 = 905,000 dwelling unit

Assume environmental costs @ \$100/du = **\$90,500,000 saved** (1 yr)

The Power of PLACES



Types of land uses:

<u>LUC</u>	Urban or Built-up land	
1100	Residential	\$90,500,000 saved
1200	Commercial	\$?
1300	Industrial	\$?
1400	Transportation, Communication, Utilities	\$?
1900	Open Space and Recreation	\$?
2000	Agriculture	\$?
4000	Water	\$?

The Power of PLACES



Land consumption in U.S. ~ 1.2 million acres/yr (485,633 ha)

Land consumption in Colorado ~ 141,000 acres/yr (57,062 ha)

Assume 10% of land could be saved = 120,000 acres/yr (48,563 ha)

Assume external costs @ \$100,000/acre = **\$12 billion annual savings**

(€8400 million)

PLACES (Planning Land And Communities to be Environmentally Sustainable)

Audience:	Land use regulation authority (communities in U.S.)
Levels: Administration	EPA (or Intl Gov) + Community
Program	Community
Application	Site
State of Development:	Ready for application (Neuse Watershed, NC)
International Transferability:	Respects all rights, Simple, use/add to catalogue
Conditions of Use:	EPA (or Intl Gov) \$ + administration Community <ul style="list-style-type: none">- acceptance of EQs- establish means of participation- planning reviews- administer renewal